

U.S. Patent Application Serial No. **10/571,266**  
Amendment filed May 12, 2010  
Reply to OA dated March 18, 2010

**REMARKS**

Claims 1 and 3-16 are pending in this application, with claims 10-16 withdrawn from consideration. Claims 3-6 are canceled without prejudice or disclaimer, and claim 1 is amended herein. Upon entry of this amendment, claims 1 and 7-16 will be pending, with claims 10-16 withdrawn from consideration. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendments to the claims is detailed below.

**Claims 1 and 3-9 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office action p. 2).**

The rejection is overcome by the amendment to claim 1. Claim 1 has been amended to delete the recitation “in such a manner that the loss-on-drying is not more than 3%, or heating gum arabic in dry state that the loss-on-drying is not more than 3%,” and to incorporate the limitations of claims 2-6, which have been canceled without prejudice or disclaimer. This amendment clarifies that the method comprises heating “dried gum arabic,” and clarifies that the “loss-on-drying” recitation is a limitation on the dried gum arabic before the heating step.

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**Claims 1 and 3-9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Inata et al. (JP 2000-166489 and Machine translation), hereinafter Inata in view of Industrial gums by Whistler et al. (page 205), hereinafter Whistler. (Office action p. 3)**

Reconsideration of the rejection of pending claims 1 and 7-9 is respectfully requested in view of the clarifying amendments to the claims.

The objective technical problem underlying the present invention is the provision of an improved method for modifying gum arabic, wherein the resultant gum arabic should have superior emulsifiability without exhibiting significant browning and/or caking. The solution to the above problem is achieved by providing the method of amended claims 1 and 7-9.

That is, the claims as amended comprise a method for producing modified gum arabic by heating the dried gum arabic, of which the diameter is not more than 1.5 mm and which has a loss-on-drying of not more than 3%, at 90-180 °C under a reduced pressure. Thereby, the present invention is characterized that an emulsifiability of gum arabic is improved without exhibiting significant browning and/or caking.

It can be understood from a comparison of the results of Table 1 (samples 1-1 to 1-5) and Table 3 (samples 3-1 to 3-5) in the present specification, that the emulsifiability of gum arabic can be improved without exhibiting significant browning and/or caking by **heating the dried gum arabic having a loss-on-drying of not more than 3% under the reduced pressure.**

The data shown in Table 3 of the present application clearly show that the modified gum arabic of the present invention cannot be obtained by heating at normal pressure, even if the gum

arabic is dried at reduced pressure prior to heating. In particular, even though the loss-on-drying of samples 3-1 to 3-5 is not more than 3 %, all these samples displayed significant browning and caking.

In addition, it can be understood from a comparison of the results of samples 1) to 5) and samples 6) to 7) in Table 7, that the emulsifiability of gum arabic can be improved without any change in appearance by heating the dried gum arabic having a loss-on-drying of not more than 3% **at 90-180°C** under the reduced pressure. As shown in samples 6) to 7), the emulsifiability of gum arabic cannot be improved without any change in appearance if a temperature is low (such as 70 °C) or high (such as 200°C) even when heating the dried gum arabic having a loss-on-drying of not more than 3% under the reduced pressure.

Furthermore, it will be understood from a comparison of the results of samples 3) to 4) and samples 1) to 2) in Table 4, that the emulsifiability of gum arabic can be improved without any change in appearance by heating the dried gum arabic, of which the **average diameter is not more than 1.5 mm** and has a loss-on-drying of not more than 3%, at 90-180°C under the reduced pressure. As shown in samples 1) to 2), the emulsifiability of gum arabic cannot be improved if its average diameter is large (such as 6 mm or 30 mm) even when heating the dried gum arabic having a loss-on-drying of not more than 3% at 90-180°C under the reduced pressure.

However, it is submitted that it has been erroneously omitted to specify in Experimental Example 2 and Table 4 of the present application that the heat treatment of the samples shown in Table 4 has also been conducted under reduced pressure. Specifically, in said Experimental Example

2 gum arabic samples were heat-treated while slowly rotating with a rotary evaporator at reduced pressure of about 0.03 atm as well as Experimental Examples 1, 3 and 5. The fact that Experimental Example 2 has been conducted at reduced pressure can be taken from a comparison of the data shown in Table 4, samples 3 and 4, of the present application with the data shown in Tables 1, 5, and 6 of the present application, which have also been generated at reduced pressure, in contrast to the data shown in Table 2 of the present application, which have been generated at normal pressure.

In contrast, Inata et al (JP 2000-166489) teaches neither a method for producing modified gum arabic, comprising the step of heating **dried** gum arabic having a loss-on-drying of not more than 3% at **a reduced pressure**, wherein the gum arabic to be heat treated has **an average particle diameter of not more than 1.5 mm**, nor a modified gum arabic obtained by said method.

Further, the solution to the objective technical problem of the present invention is not obvious to a person skilled in the art from the disclosure of Inata et al. In this context, it should be noted that in order to achieve the advantageous properties of the modified gum arabic of the present invention, i.e., a superior emulsifiability without significant browning and/or caking, it is important not only to heat dried gum arabic at reduced pressure, but also to use gum arabic having an average particle diameter of not more than 1.5 mm. Inata et al. neither teaches nor suggests an average particle size of not more than 1.5 mm, let alone any of the superior characteristics of a modified gum arabic that results therefrom. Further, Inata et al. does not disclose heating the gum arabic at reduced pressure, or the use of dried gum arabic. Moreover, Inata et al. does not even recognize the problem of browning and/or caking. Therefore, a person skilled in the art would not have turned to Inata et

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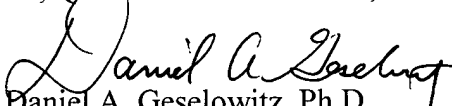
al. when trying to solve the technical problem underlying the present invention. Further, even with knowledge of Inata et al., a person in the art would not have arrived at the claimed subject matter of the present application without inventive efforts.

Thus, the subject matter of amended claims 1 and 7-9 is not obviousness over Inata et al. in view of Whistler et al.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,  
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